Space Weather Forecast

Issued on Tuesday, 22 March 2022 at 00:22 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of G1/Minor Storm Day 3 (24 March). Slight chance of R1/Minor radio blackouts.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Very Low over the past 24 hours, with only minor background flares during this period. There are currently 3 sunspot regions on the visible disc - all appear to have little complexity and are currently quiet.
An energetic far-sided Coronal Mass Ejection (CME) was seen on satellite imagery, heading away from the Earth with the source not visible from our viewpoint. No Earth-directed CMEs were observed in the period.

Solar Wind / Geomagnetic Activity: The solar wind was at largely background levels through the period, with the solar wind speed varying between 290-340 km/s. The Interplanetary Magnetic Field was mostly weak, with the north-south component varying weakly but often northward directed, before becoming more southward directed after 21/2120 UTC. Geomagnetic activity was Quiet (Kp 1-2).

Energetic Particles / Solar Radiation: Solar radiation showed an enhancement in the period, with this likely to be related to the far-sided CME-generating event mentioned above. The 10MeV proton flux peaked short of the S1/Minor radiation storm threshold and is now declining. The 100MeV trace also appears to have peaked short of warning thresholds, and is very slowly easing.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is forecast to continue Very Low or Low, with just a very slight chance of Moderate-class flares. Potential new regions are due to rotate onto the visible disc in the coming days, but it is difficult to assess the likelihood of flaring at this stage.

Solar Wind / Geomagnetic Activity: There is one possible Earth directed CME in the forecast, potentially giving Earth a glancing blow around 24/2300UTC. No other CMEs feature in the forecast. There is also a possible coronal hole fast wind due, most likely on Day 3 (24 March) - however effects from this feature are likely to be muted.
Geomagnetic activity is expected to be mainly Quiet to Unsettled through much of the period, but with an increase possible on Day 3 giving a chance of Active intervals and a slight chance of G1/Minor Storm intervals.

Energetic Particles / Solar Radiation: Solar radiation is expected to revert to Background levels and is likely to stay that way after the current enhancement.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	10	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	5	5	5	5
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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